

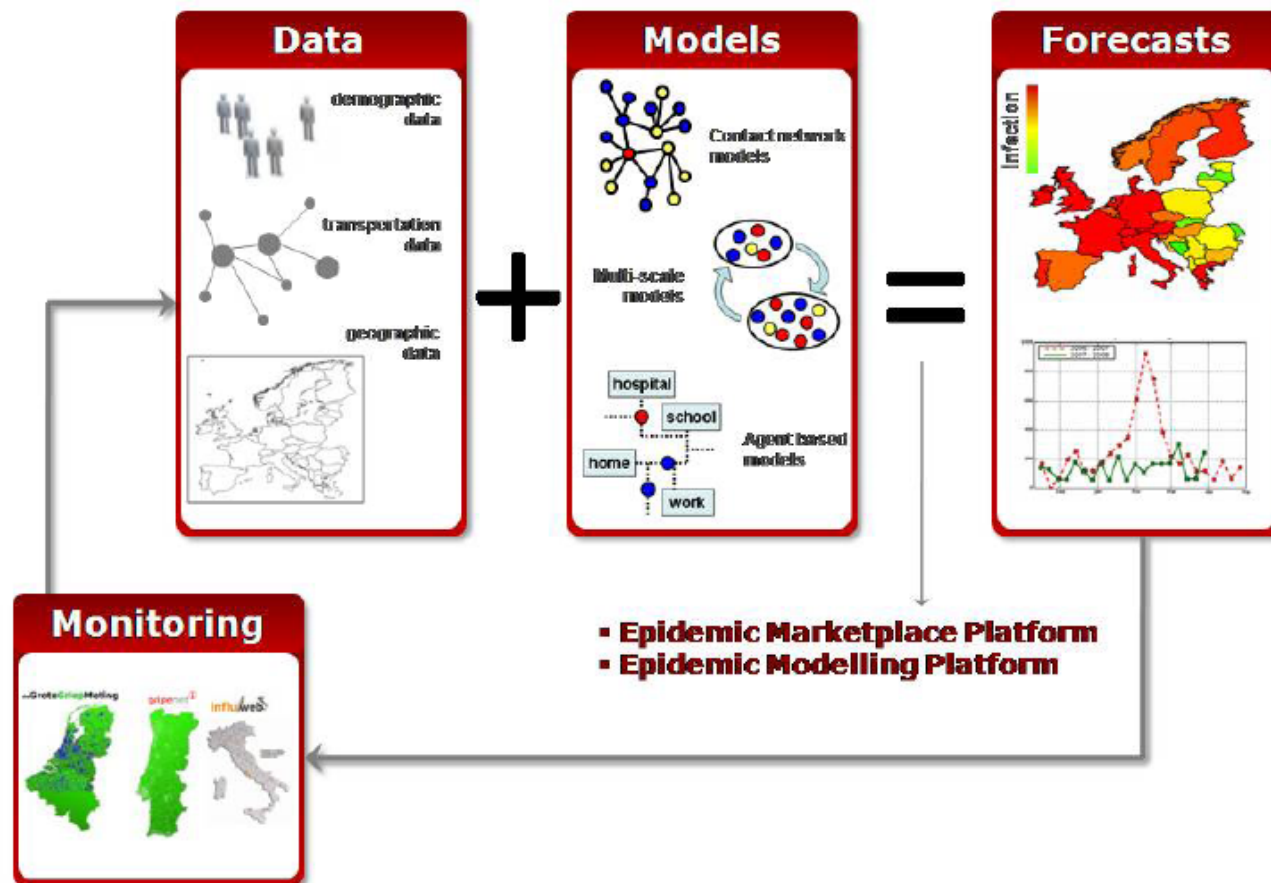
# Epiwork's Epidemic Marketplace

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# Epiwork – General View



# Outline

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- ❑ Epiwork Work Package 3
  - ❑ Epidemic Marketplace General Architecture
  - ❑ Epidemic Marketplace – Initial Deployment
  - ❑ Epidemic Marketplace –Future Developments
  - ❑ Integration with WP4
  - ❑ Integration with WP5
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# Univ Lisbon/LASIGE Team

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- Biomedical Informatics Res Line
  - Information Integration Res Line
  - Epiwork Team
    - Mário J. Silva
    - Francisco Couto
    - Fabrício Silva
    - Luís Filipe Lopes, post-doc
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# EPIWork WP3 - Epidemic Marketplace – Main Features

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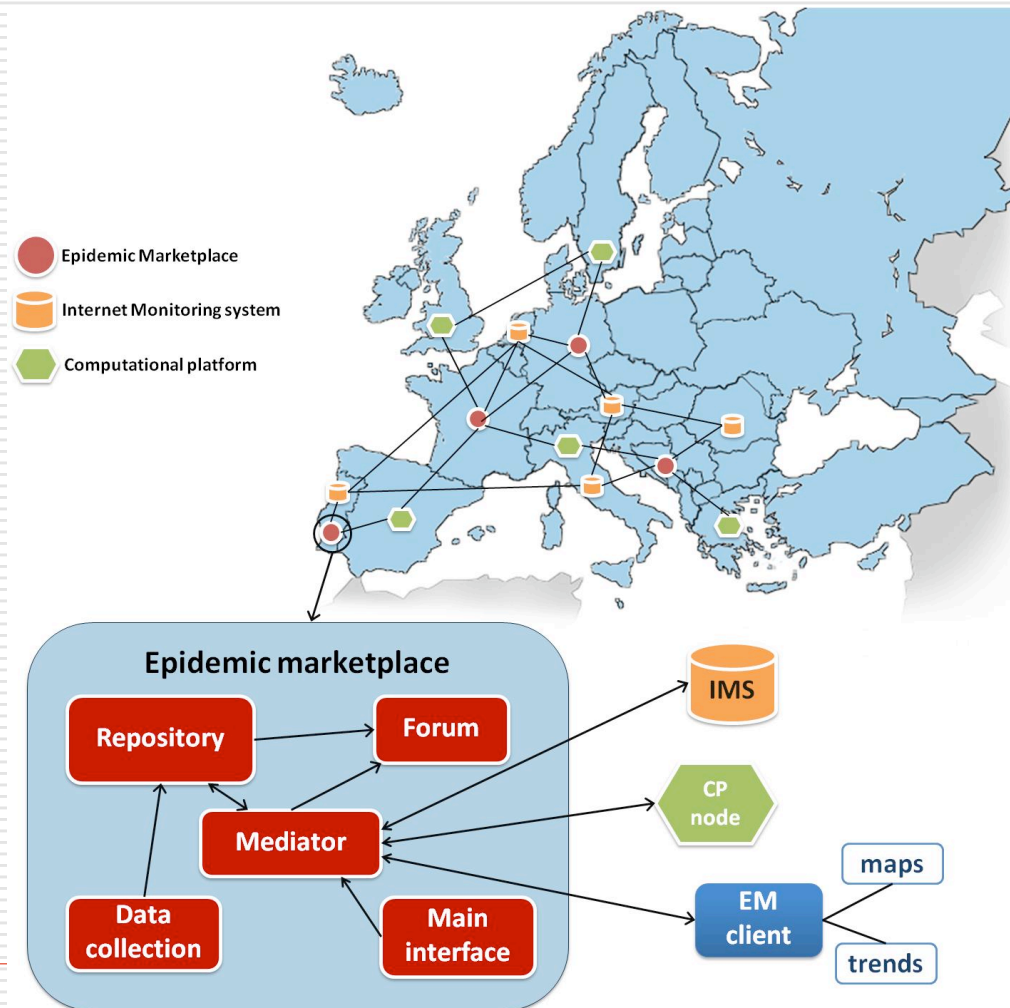
1. **Repository with epidemic data sets and catalogue of epidemic datasources** containing the metadata describing existing databases;
  2. **Forum** to publish information about their own data, seeking modellers to collaborate with, and/or to seek sources of data that could be of interest to their epidemiological modelling efforts;
  3. Host of **mediating software** that can automatically process queries for epidemiological data available from the information sources connected to the platform.
    - Definition of a common meta-model for querying data of interest for epidemiological modeling architecture using state-of-the-art semantic-web/grid technologies.
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# Epidemic Marketplace – Main Requirements

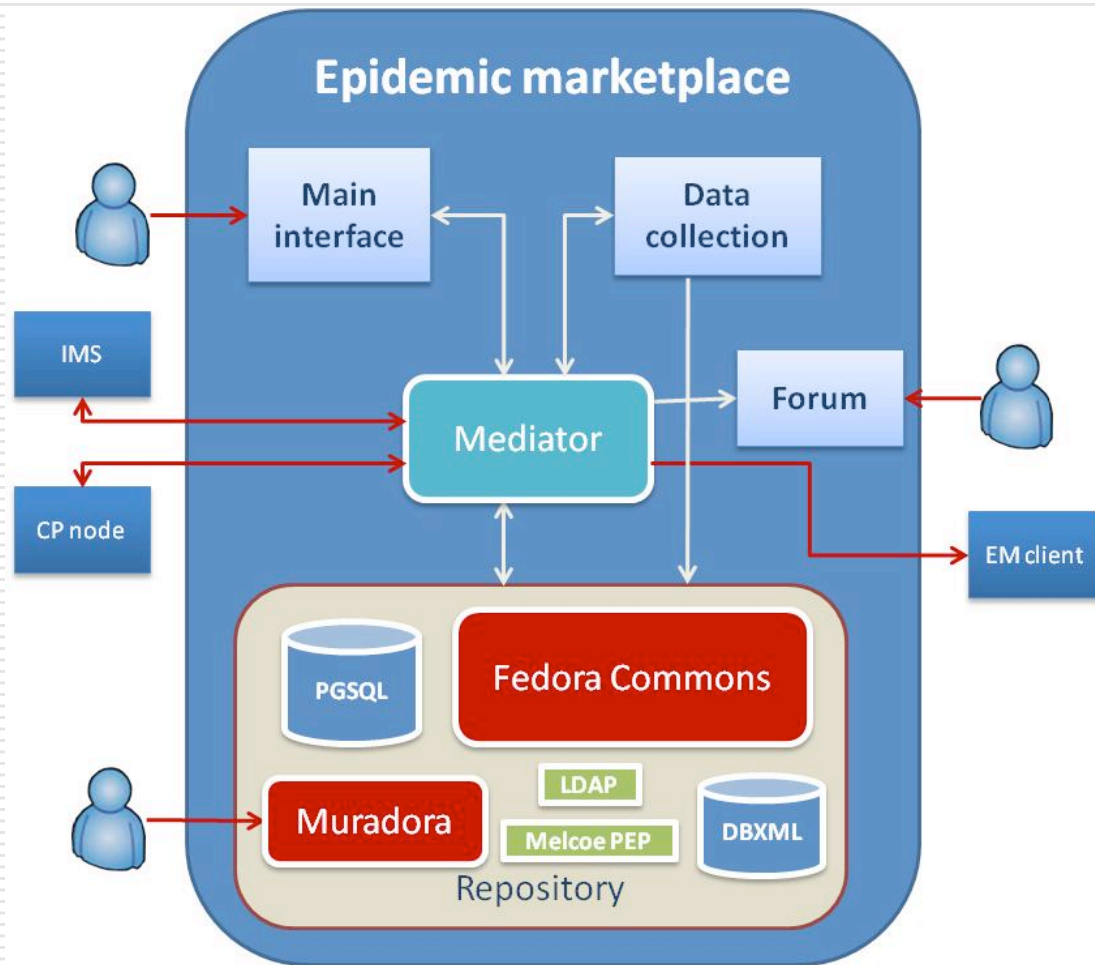
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- ☐ **Support the sharing and management of epidemiological data sets**
  - ☐ **Support the seamless integration of multiple heterogeneous data sources**
  - ☐ **Support the creation of a virtual community for epidemic research**
  - ☐ **Distributed Architecture**
  - ☐ **Support secured access to data**
  - ☐ **Support data analysis and simulation in grid environments**
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# Epidemic Marketplace Architecture



# Epidemic Marketplace Architecture





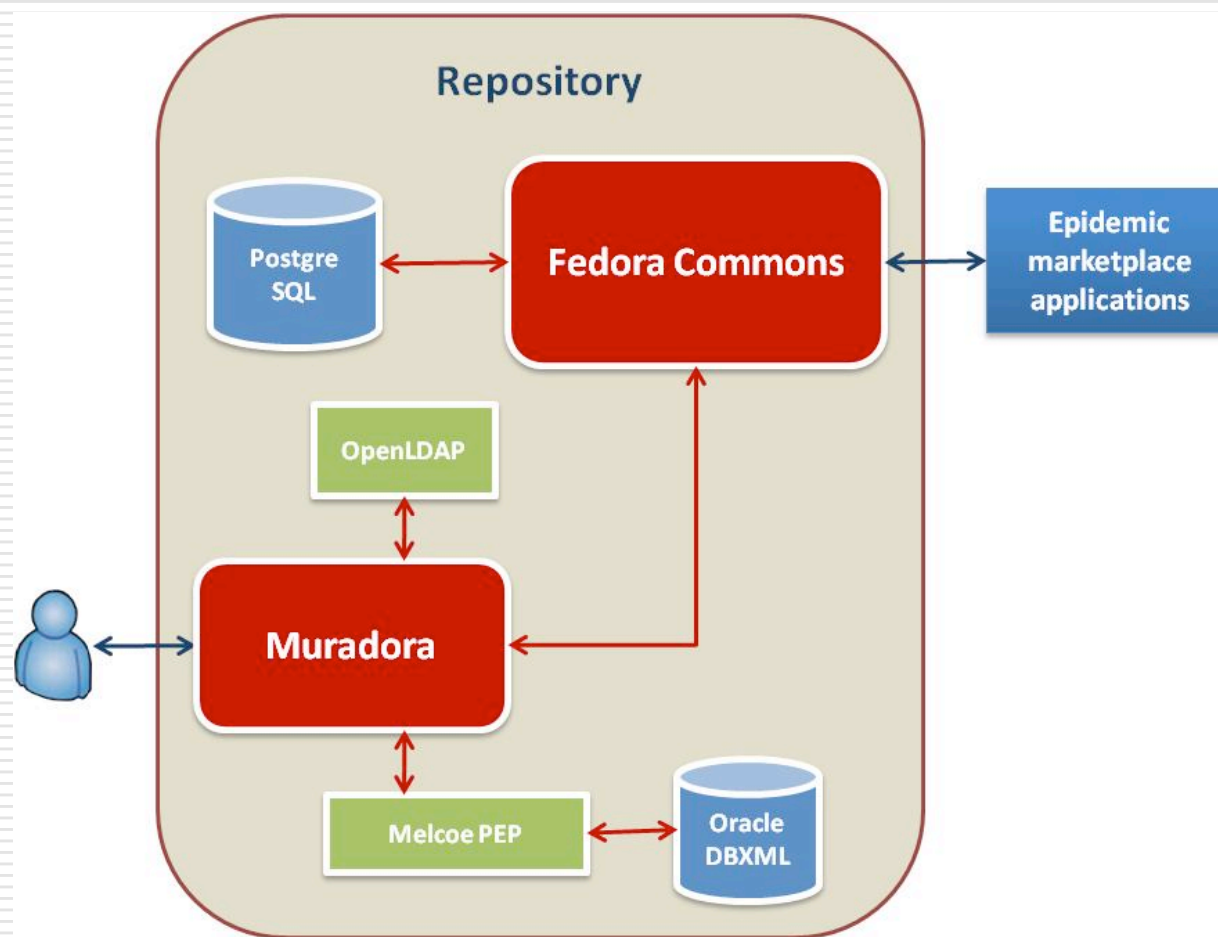
# Epidemic Marketplace – Initial Deployment

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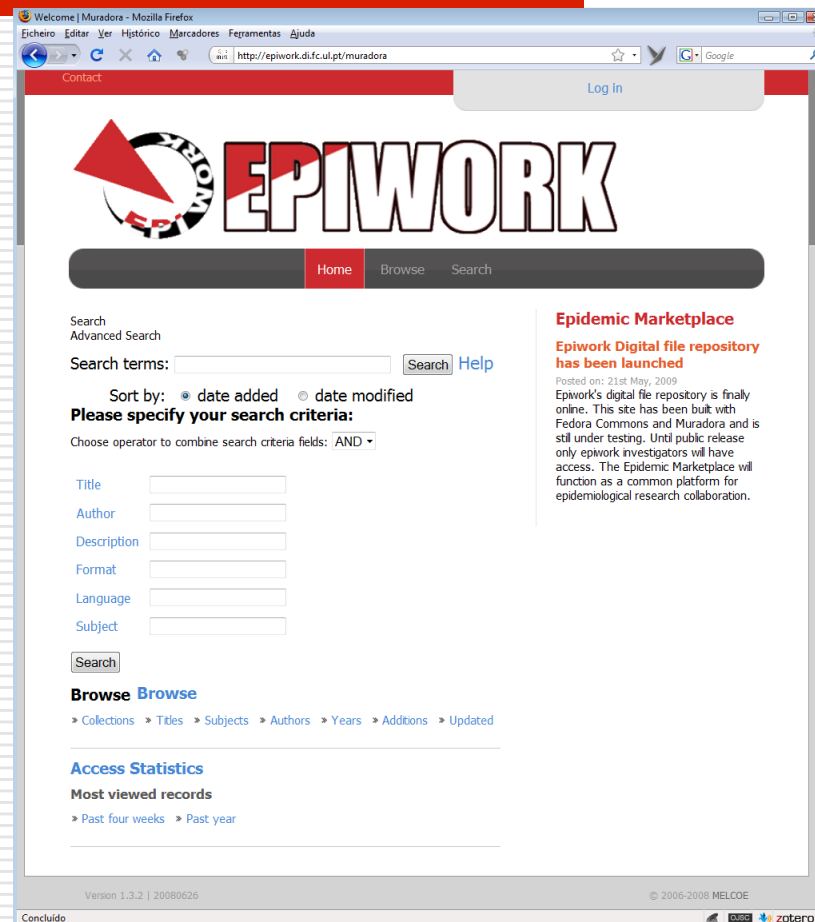
- ☐ Fedora used as Data Repository
  - ☐ Front-end: Muradora
    - File upload capability
  - ☐ Dublin Core metadata
  - ☐ Browse and search capabilities
  - ☐ Access control mechanisms
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# Epidemic Marketplace – Initial Deployment

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# Epidemic Marketplace – Initial Deployment



<http://epiwork.di.fc.ul.pt>

# Epidemic Marketplace – Initial Deployment

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- As the main site of the E.M., adequate hardware and network resources are needed
  - Hardware platform
    - Two Dell servers PowerEdge SC1435
    - Two Iomega Network Storage Servers
    - 12 TB total disk space
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# Epidemic Marketplace – Initial Deployment

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## ☐ Network Infrastructure

- 2Gb connection to FCCN
    - ☐ FCCN is Responsible for the Portuguese infrastructure of advanced network for collaboration and communication in the fields of teaching and research
  - 10Gb connection between FCCN and the Géant Network (research & higher education European network)
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# Epidemic Marketplace – Future Developments

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- **Data collector** -seamless integration of multiple heterogeneous data sources available on the Web
  - First prototype to retrieve data from twitter
  - Main components
    - Data Storage
    - Web Crawler
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# Epidemic Marketplace – Future Developments

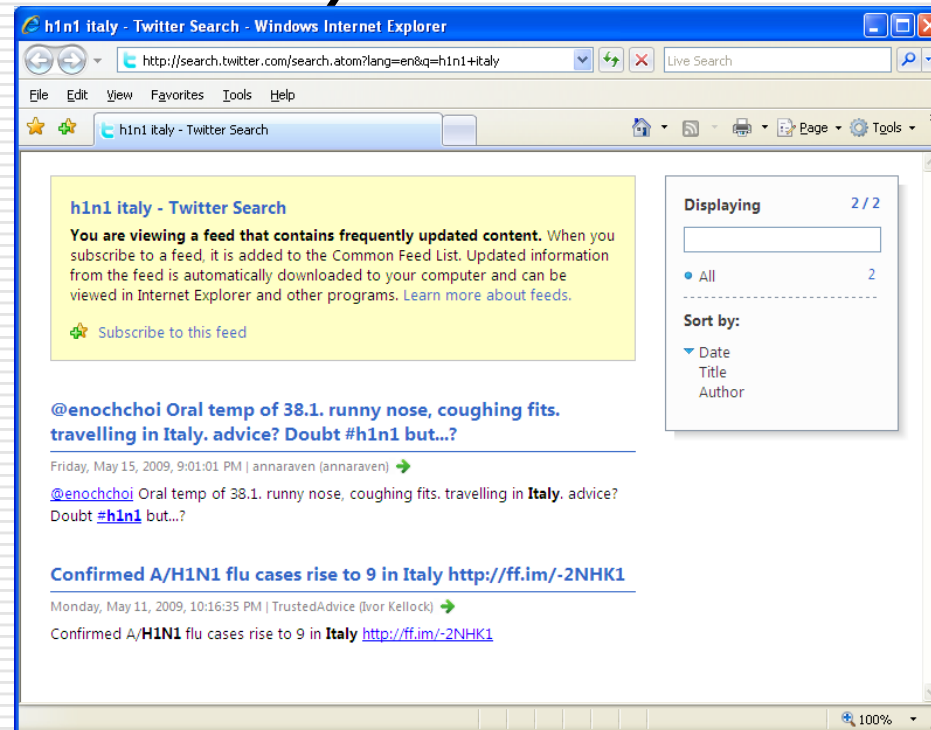
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- Interacts directly with E.M.'s repository
    - Can publish epidemic data sets created from data retrieved through web crawlers
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# Epidemic Marketplace – Future Developments

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- ❑ Web Crawler example – searching for *h1n1* and *Italy* in twitter





# Epidemic Marketplace – Future Developments

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- ❑ **Mediator**- This module will deploy a set of services available through a REST API that:
    - Exposes the data stored
    - Receives new data via web services
    - Updates data
    - Interacts with other instances of the E.M.
    - Send notifications to E.M.'s forum and external applications
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# Epidemic Marketplace – Future Developments

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- ❑ External data sources can use this API to Select, Insert and Update data
  - ❑ To be used by system developers to upload and retrieve data
  - ❑ Some examples:
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# Epidemic Marketplace – Future Developments

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## □ Select methods - Example

- <http://epiwork.di.fc.ul.pt/select?dea=h1n1&loc=italy&days=7>

- The result will be returned in XML or JSON format.

## □ Insert methods - Example

- <http://epiwork.di.fc.ul.pt/insert?dea=h1n1>

## □ Update methods - Example

- [http://epiwork.di.fc.ul.pt/update?odea=swine flu&ndea=h1n1](http://epiwork.di.fc.ul.pt/update?odea=swine%20flu&ndea=h1n1)

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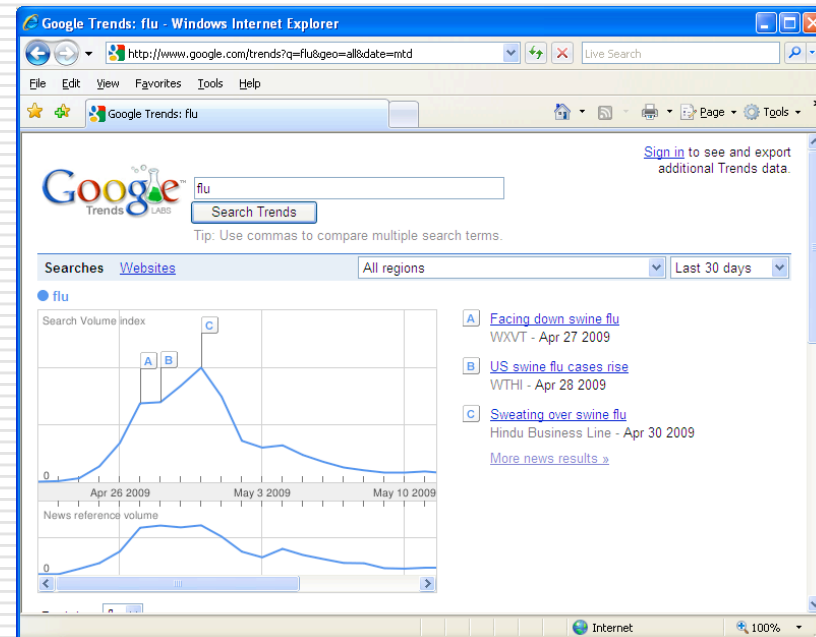
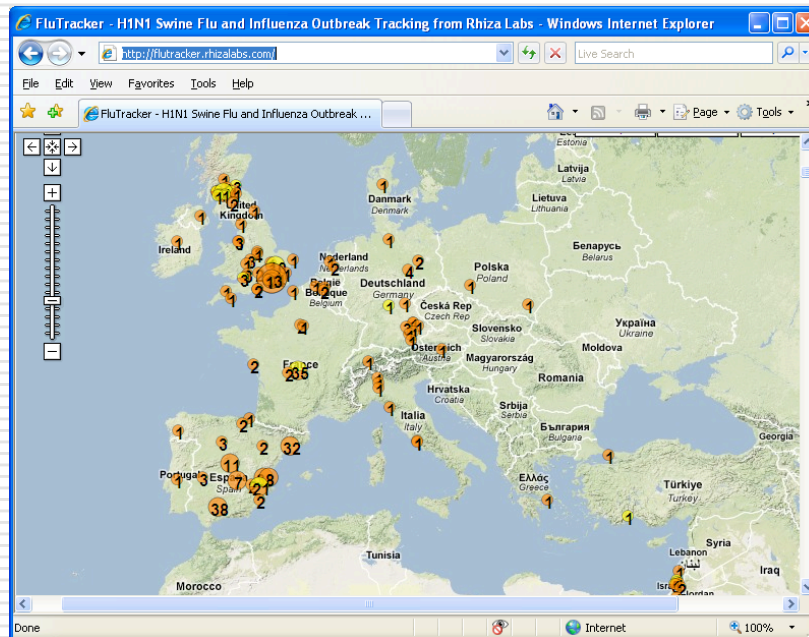
# Epidemic Marketplace – Future Developments

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- ❑ **E.M. Forum** – A forum will be implemented to foster collaboration among partners and to disseminate information
  - ❑ Integrated with both the Repository and Data collector
  - ❑ Possibility of receiving notifications about data updates through subscriptions
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# Epidemic Marketplace – Future Developments

- ❑ **E.M. Client** – A graphical, illustrative client for the E.M.



# Epidemic Marketplace – Future Developments

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- Semantically enabled repository
    - Data Integration
      - Navigation through multiple ontologies
      - Proposal of new ontologies with the participation of the community
    - Semantically enabled Workflows
      - Simplify data processing in multiple steps
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# Integration with WP4

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- Build-in data search capability
    - Available through mediator services
  - Easy integration with Grid Infrastructures
    - Mediator services can be integrated to the Grid security infrastructure and information systems
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# Integration with WP4

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- Workflow support
    - Both input and output data from simulations can be stored in E.M.'s Repository
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# Integration with WP5

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- ❑ Data integration between WP3 and WP5
    - two possibilities:
      - Upload of data sets
      - Streaming connection to WP3 Data Collector
  - ❑ Enable integrated access to other data stored in the E.M.'s repository
  - ❑ Enable integrated access to a comprehensive list of external data sources available through the Data Collector
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# Integration with WP5

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- ❑ Advanced authorization (single sign-on) and access control capabilities
  - ❑ First Data collector prototype will retrieve data from Twitter
  - ❑ The same prototype can be easily adapted to interact with IMS sites
    - One first experiment with Lisbon's IMS site can be scheduled soon
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# Conclusion

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- ❑ Epidemic Marketplace already available at **<http://epiwork.di.fc.ul.pt>**
  - ❑ We need your data and your input!
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# Thank you!

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